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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,448	03/18/2004	Yuan-Hung Liu	N1085-00170	5388
54657	7590	08/09/2005	[TSMC2003-001]	
DUANE MORRIS LLP IP DEPARTMENT (TSMC) 4200 ONE LIBERTY PLACE PHILADELPHIA, PA 19103-7396			EXAMINER PHAM, LONG	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/803,448	Applicant(s) LIU ET AL.	
	Examiner Long Pham	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 1-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 18-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>03/08/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 18-29 in the reply filed on 06/17/05 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by Young et al. (US patent 6,812,120).

With respect to claim 18, Young et al. teach a method of making a flash memory cell comprising a floating gate with corners each having a sharp, upwardly flared shape, the method comprising the steps of (see figs. 3 and 4A-4D and associated text):

providing a substrate 200 of semiconductor material;

forming a mask film 204 over the substrate;

defining a trench 206 in the mask film;

at least partially filling the trench with a first film of electroconductive material 210; and

etching back a portion of the first film of electroconductive material to partially form the floating gate with the sharp, upwardly flared corners.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 19-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young et al. (US patent 6,812,120) as applied to claim 1 above, and further in view of Chang et al. (US publication 2005/1045920) and Kamiya et al. (US publication 2003/0209753) and Hsu et al. (US patent 6,569,736).

With respect to claims 21, 22, and 23, Young et al. fail to teach forming a dielectric over the floating gate.

Chang et al. teach forming a dielectric material 112 over a floating gate 110 to provide isolation for floating gate. See [0024].

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to form dielectric material over the floating gate in the process of Young et al. to attain the above advantage.

With respect to claims 19 and 20, Young et al. teach forming two floating gates 214a, 214b by forming a single conductive layer and simultaneously etching but fail to teach forming the two floating gates by sequentially forming two conductive layers and sequentially etching the two conductive layers.

Kamiya et al. teach forming a two floating gates by sequentially forming two polysilicon layers and sequentially etching the two polysilicon layers. See [0017].

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the above teaching of Kamiya et al. into the process of Young et al. to achieve easier control of etching. See [0011].

With respect to claims 24, 25, and 26, Young et al. further teach the substrate includes at least two shallow trench electrical isolation regions 102 (see fig. 3) and forming a conductive layer over the substrate having the two trench isolation regions (see col. 4, lines 1-10) (that is the conductive layer covers two trench isolation regions) and selectively removing portions of the conductive layer covering the shallow trench isolation regions (see fig. 3).

With respect to claims 27, 28, and 29, Young et al. fail to teach forming a dielectric spacer on the floating gate structure comprising of a floating gate and an overlying cap layer.

Hsu et al. teach forming a dielectric spacer 48 on a floating gate structure having a floating gate 50 and an overlying oxide cap layer 46. See fig. 2C and associated text.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the above teaching of Hsu et al. into the process of Young et al. to eliminate the bridging of metal silicides. See col. 2, lines 20-40.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on M-F, 7:30AM-3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Long Pham

Primary Examiner

Art Unit 2814

LP